

### **AMENDED CLAIMS**

1. (Currently Amended) A video-based surgical targeting system comprising:
  - a patient-specific database comprising a plurality of 2-D images of the anatomical structure of a patient;
  - a patient-specific 3-D computer model of said anatomical structure of said patient, said patient-specific 3-D computer model being assembled from said plurality of 2-D images contained in said patient-specific database;
  - at least one virtual graft or implant for insertion into the 2-D images contained in the patient specific database and/or the 3-D computer model;
  - graft-placement apparatus for (i) inserting the at least one virtual graft or implant into said 2-D images contained in said patient-specific database, and/or (ii) inserting the at least one virtual graft or implant into said 3-D computer model;
  - an image generator for generating a virtual image of the anatomical structure modeled by said patient-specific 3-D computer model;
  - a real-time image generating device for generating a real image of the anatomical structure of a patient;
  - a video mixing device for selectively mixing said virtual image and said real image into an output image, whereby said output image comprises either one of the two images exclusive of the other, or a composite of both images wherein the virtual image and the real image are simultaneously displayed in registration with one another; and
  - display means for displaying said output image.
  
2. (New) A video-based surgical targeting system according to claim 1 comprising at least one virtual graft and no virtual implant.
  
3. (New) A video-based surgical targeting system according to claim 1 comprising at least one virtual implant and no virtual graft.

4. (New) A video-based surgical targeting system according to claim 1 further comprising registration means for placing said virtual image in registration with said real image.
5. (New) A video-based surgical targeting system according to claim 4 wherein said registration means include means for manually aligning said virtual image with said real image.
6. (New) A video-based surgical targeting system according to claim 4 wherein said registration means include means for automatically aligning said virtual image with said real image.
7. (New) A video-based surgical targeting system according to claim 6 wherein said registration means includes tracking means for tracking the position of said real-time image generating means.
8. (New) A video-based surgical targeting system according to claim 2 wherein said system further comprises patient tracking means for tracking the position of said anatomical structure.
9. (New) A video-based surgical targeting system according to claim 1 wherein said patient specific database comprises other patient-specific data in addition to said plurality of 2-D images.
10. (New) A video-based surgical targeting system according to claim 1 wherein said patient-specific computer model includes other patient-specific data in addition to the 2-D image data obtained from the patient-specific database.
11. (New) A video-based surgical targeting system according to claim 10 wherein said other patient-specific data obtained comprises information any one or more of

the following: a 3-D surface digitizer, a temperature probe, and a chemical probe.

12. (New) A video-based surgical tracking system according to claim 1 wherein said real-time image generating means comprise a video camera.
13. (New) A video-based surgical targeting system according to claim 1 wherein said real-time image generating means comprises an endoscope.
14. (New) A video-based surgical targeting system according to claim 1 wherein said real-time image generating means comprises an ultrasound device.
15. (New) A video-based surgical targeting system according to claim 1 wherein said patient-specific 3-D computer model is constructed out of one or more polygonal models.
16. (New) A video-based surgical targeting system according to claim 1 wherein said image generator generates said virtual image by a volume rendering process.
17. (New) A video-based surgical targeting system according to claim 1 wherein said real-time image generating means is adapted to dynamically update said patient specific database with said real image.
18. (New) A video-based surgical targeting system according to claim 4 wherein said registration means comprises means for maintaining said virtual image and said real image in registration with one another even when said real-time image generating means move relative to said anatomical structure.